

CLAIMS

1. Ink jet printing device (20, 54, 61) with a head (21, 73) or with heads (21a, 21b, 21c) of parallel or serial-parallel type, comprising a plurality of ejection modules (22) each of which with chambers (23) suitable for containing ink and with associated relative heating elements (24) for commanding ejection of the ink, said device being characterized in that it comprises ejection nozzles (32) aligned along a same direction (X axis), a support common to the modules (22) and hydraulic tight means, and in which:
the support comprises a base plate (27, 56, 62) of rigid material that defines through its thickness a feeding duct (33, 58a, 58b, 58c) for the ink which, in use, is substantially parallel to the line of printing (X axis); and
the ejection modules (22) are mounted side by side on said support plate (27, 56, 62) and with the chambers (23) arranged in a line along the same direction (X axis) and in hydraulic connection with the feeding duct (33),
said hydraulic tight means achieving a hydraulic tight connection between the said modules (22) and the feeding duct (33).
2. Device according to claim 1, characterized in that said hydraulic tight means comprises a lamina mounted between the modules (22) and, through suitable means (42, 63), the support.
3. Device according to claim 1 or 2, characterized in that said ejection nozzles (32) are obtained from a nozzle plate (28, 64) constituting a hydraulically tight, upper closing surface for said chambers (23) and in which said ejection nozzles (32) are in hydraulic connection with corresponding chambers (23) of the above-mentioned modules (22).
4. Device according to any of the previous claims, characterized in that it comprises a secondary tank (31) in hydraulic connection with the feeding duct (33) and integral with said plate (27, 54, 62), capable of receiving a fill of ink.
5. Device according to any of the previous claims, characterized in that it comprises an elastic joint filter (52) for a removable cartridge (53, 57a, 57b, 57c) and in which said joint allows freedom of movement between said plate (27, 54, 62) and said cartridge and has a filter function for the ink of the above-mentioned cartridge (53, 57a, 57b, 57c).
6. Device according to any of the previous claims, characterized in that said feeding duct is a slot-shaped aperture extended in the longitudinal direction along which the modules are disposed (X axis).

7. Device according to any of the previous claims and enclosing claim 2 or 3, characterized in that said chambers (23) are in hydraulic connection with a front (36) of the module and in which a counterpart (42, 63) is provided of the same thickness as the modules (22), mounted on the base plate (27, 56, 62) parallel to the front of the modules (22), delimited by the lamina or the nozzle plate (28) and connected to the duct, defining a passage for the ink (50) for said chambers.

8. Device according to claims 3 and 7, characterized in that said chambers (23) are defined as notches in a polymerizable film deposited on a die (34) of the module and in which the nozzle plate (28, 64) is stuck tight by polymerization, with said film on the modules (22) and with an adhesive on said counterpart (42, 63).

9. Device according to any of the previous claims, characterized in that the base plate (27, 62) supports electric interfacing circuits for said modules (22).

10. Device according to one of the claims from 1 to 8 and enclosing claim 3, characterized in that said nozzle plate (28) supports electric interfacing circuits for said modules (22).

11. Device according to any of the previous claims, characterized in that it comprises various rows of a plurality of modules (22) for various colours and in which said rows of modules (22) are arranged in an array on a support plate (56) which defines various feeding ducts (58a, 58b, 58c) for the chambers (23) of the above-mentioned rows of modules.

12. Device according to any of the previous claims, characterized in that said support plate and said modules define the head (21, 73) or the heads (21a, 21b, 21c) and in which said head (21, 73) or said heads (21a, 21b, 21c) are capable of alternating motion in relation to the print medium (26) for a serial-parallel printing with printing resolution greater than the physical resolution of the pitch between the nozzles.

13. Manufacturing process for producing an ink jet printing device (20, 54, 61) with a head (21, 73) or with heads (21a, 21b, 21c) of parallel or serial-parallel type, comprising a plurality of ejection modules (22) each of which with chambers (23) suitable for containing ink and with associated relative heating elements (24) for commanding ejection of the ink, said process being characterized in that it comprises the steps:

a- providing a support (27, 56, 62) common to the modules (22) and which defines a slot-shaped aperture (33) for the ink which constitutes a feeding duct for the ink and a nozzle plate (28, 64) in which the ejection nozzles (32) are arranged substantially in a line along a same direction (X axis);

b- fixing the ejection modules (22) on said support (27, 56, 62) in hydraulically tight connection and such that the respective edges (36) are aligned and face the slot-shaped aperture (33); and

c- hydraulically tight fixing the nozzle plate (28, 64) on the modules (22) and the support (27, 62) in manner that the nozzles (32) face on the chambers (23) thereby forming the upper closing surface of the ejection chambers (23) and of the feeding duct for the ink.

14. Ink jet printing device (20, 54, 61) with a head (21, 73) or with various heads (21a, 21b, 21c) of the serial-parallel type, comprising a plurality of ejection modules (22), each of which with chambers (23) suitable for containing ink and with associated relative heating elements (24) for commanding ejection of the ink and with a cartridge (57) or with various cartridges (57a, 57b, 57c) of ink for the head (21, 73) or for the heads (21a, 21b, 21c), said device being characterized in that

the ejection modules (22) are mounted side by side with the chambers (23) arranged in a line along a same direction (X axis),

said modules are capable of alternating motion in relation to the print medium (26) for a printing resolution greater than the physical resolution of the pitch between the nozzles, and said cartridge (57) or said cartridges (57a, 57b, 57c) of ink are connected removably to said modules through an elastic joint (52) or various elastic joints for decoupling between the modules (22) and said cartridge.

15. Ink jet printing device (20, 54, 61) with a head (21, 73) or with various heads (21a, 21b, 21c) of the serial-parallel type, comprising a plurality of ejection modules (22) each of which with chambers (23) suitable for containing ink and with associated relative heating elements (24) for commanding ejection of the ink on a print medium (26), and with a cartridge (57) or with various cartridges (57a, 57b, 57c) of ink for the head (21, 73) or for the heads (21a, 21b, 21c), said device being characterized in that

the ejection modules (22) are mounted side by side with the chambers (23) arranged in a line along a same direction (X axis); and

said print medium (26) is capable of alternating motion in relation to said modules for a serial-parallel printing with printing resolution greater than the physical resolution of the pitch, and said cartridge (57) or said cartridges (57a, 57b, 57c) of ink are hydraulically connected removably to said modules.

16. Printer comprising an ink jet device (20, 54, 61) with a head (21, 73) or with heads (21a, 21b, 21c) of serial-parallel type, comprising a plurality of ejectors each of which with chambers (23) suitable for containing ink and with associated relative heating elements (24) for commanding ejection of the ink on a print medium (26) capable of feeding motion, said printer
5 being characterized in that
said head (21, 73) or each of said heads (21a, 21b, 21c) comprises a plate (27, 56, 62) which defines a feeding duct (33, 58a, 58b, 58c) for the ink; and
said ejectors face on to said plate (27, 56, 62) and with the chambers (23) arranged in a line along a same direction (X axis), in hydraulic, tight connection with the feeding duct (33); and
10 in which
between said plate (27, 56, 62) and said print medium alternating motion is provided, synchronous with the continuous feeding motion of said print medium for a printing resolution greater than the physical resolution of the pitch between the nozzles.
17. Printer comprising an ink jet (20, 54, 61) device with a head (21, 73) or with heads
15 (21a, 21b, 21c) of the parallel or serial-parallel type, comprising a plurality of nozzles (32) and with associated relative heating elements (24) for commanding ejection of the ink, said printer being characterized in that said nozzles are side by side and arranged in a line along a same direction (X axis);
and in which
20 one or more plugs (83a, 83b e 83c) are provided, capable of movement for sealing the nozzles of the head or of the heads 21a, 21b and 21c, when printing is concluded.
18. Printer comprising an ink jet (20, 54, 61) device with a head (21, 73) or with heads (21a, 21b, 21c) of the parallel or serial-parallel type, comprising a plurality of nozzles (32) and with associated relative heating elements (24) for commanding ejection of the ink, said printer
25 being characterized in that
said nozzles are side by side and arranged in a line along a same direction (X axis);
and in which
a bin (77) is provided for a series of paper cards (78), beside said heads and also a skimming and feeding mechanism for skimming said paper cards from the bin and bringing them to a
30 working configuration for the said head or said heads.

19. Printer according to claim 18, characterized in that the skimming and feeding mechanisms for the paper cards (78) are provided by means of a skimming roller (84), a pair of feeding rollers (86), two intermediate rollers (87) and two pairs of terminal rollers (88).

20. Printing device and process for manufacturing same, substantially as described, with
5 reference to the figures on the accompanying drawings.